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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,803	09/09/2003	Partho Sarkar	2281-1-3	1819

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EXAMINER	
ALEJANDRO, RAYMOND	
ART UNIT	**PAPER NUMBER**
1745	

DATE MAILED: 02/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/658,803	SARKAR ET AL.	
	Examiner	Art Unit	
	Raymond Alejandro	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *07/18/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for domestic priority under 35 U.S.C. 119(e).

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 07/18/05 was considered by the examiner.

Drawings

3. The drawings were received on 09/09/03. These drawings are acceptable.

Specification

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It *should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," "This invention", etc.*

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 10 recites the limitation "the composition" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-9 and 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Shibata et al 2002/0164523.

The present application is directed to an anode-supported solid oxide fuel cell wherein the disclosed inventive concept comprises the specific anode support layer.

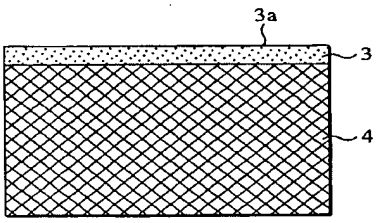
<u>As to claims 1 and 12:</u>

Shibata et al disclose a unit cell for a solid electrolyte fuel cell including an air electrode, a fuel electrode and a solid electrolyte sandwiched therebetween, and a porous metallic base body joined at least one of the air electrode and the fuel electrode (ABSTRACT). The porous metallic base body serves to pass fuel gas to be supplied to the fuel electrode while allowing a cell power output to be collector from a reacting area (ABSTRACT). The solid oxide electrolyte is also disclosed (P. 0002).

Shibata et al further disclose that porous metallic base body is formed of a laminated body that includes more than two (2) layers of porous base body layers of the same kinds having different porosity rates or of the different kinds (P. 0047). It is disclosed that the layers provide the supporting and gas-flow passage functions (P. 0047/CLAIM 1). *Thus, the layers must have vias extending through the thickness dimension.*

Figure 7 illustrates the porous metallic base body taking the form of a laminated structure that includes a first surface layer, having an electrode forming layer 3a, adapted to be held in contact with an associated electrode, and a second surface layer 4 with is porosity rate different from that of the first surface layer (P. 0047).

FIG.7



Disclosed is that the porous metallic base body is made of nickel, silver and a W-based alloy and/or alloy thereof (P. 0044). *Thus, the porous metallic base body does contain a catalytic and electronically conductive material.*

As to claim 2:

Disclosed is that the porous metallic base body is made of nickel, silver and a W-based alloy and/or alloy thereof (P. 0044). *Thus, the porous metallic base body does contain a catalytic and electronically conductive material.*

As to claim 3:

Shibata et al teach the use of ceramic which is plated with the above metals or alloy thereof to make the porous metallic base body (P. 0044). **EXAMPLE 1** shows the combined use of a ceramic (alumina) with Ni (See EXAMPLE 1).

As to claim 4:

Shibata et al disclose a unit cell for a solid electrolyte fuel cell including an air electrode, a fuel electrode and a solid electrolyte sandwiched therebetween, and a porous metallic base body joined at least one of the air electrode and the fuel electrode (ABSTRACT).

As to claims 5-6:

Shibata et al show in **EXAMPLE 1** that the fuel electrode along with the porous metallic base body contains Ni-8%YSZ (See EXAMPLE 1). *Thus, anode support layer structure, as a whole, contains the claimed material uniformly distributed throughout the anode itself.*

As to claims 7-8:

Disclosed is that the porous metallic base body is made of nickel, silver and a W-based alloy and/or alloy thereof (P. 0044). *Thus, the porous metallic base body does contain a catalytic and electronically conductive material.*

Shibata et al further disclose that porous metallic base body is formed of a laminated body that includes more than two (2) layers of porous base body layers of the same kinds having

different porosity rates or of the different kinds (P. 0047). *The difference in porosity is associated with gradient concentration of the materials forming the porous metallic base body.*

As to claims 9 and 13:

Shibata et al show in **EXAMPLE 1** that the fuel electrode along with the porous metallic base body contains Ni-8%YSZ (See EXAMPLE 1). *Thus, anode support layer structure, as a whole, contains the claimed material uniformly distributed throughout the anode itself.*

Additionally, **Figures 10A and 10B** illustrates porous base bodies 1 and 2 comprising surface layers having pore rates of 60 %, 50 %, 70 %, 74 % and even 92 % (See Figures 10A-B). *Hence, Shibata et al provides specific guidance about the porosity of the layers comprising the porous base bodies.*

As to claim 11:

It is disclosed that the layers provide the supporting and gas-flow passage functions (P. 0047/CLAIM 1). *Thus, the layers must have vias extending through the thickness dimension.*

Thus, the present claims have been anticipated.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 7-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibata et al 2002/0164523 as applied to claim 4 above, and further in view of Sammes et al 2002/0028367.

Shibata et al is applied, argued and incorporated herein for the reasons above. However, Shibata et al does not expressly disclose the specific amount of the nickel-based material; and the specific gradient of Ni concentration.

As to claims 7-8:

Sammes et al disclose an electrode-supported solid state electrochemical cell (TITLE) being an anode-supported solid oxide fuel cell having (ABSTRACT). Disclosed is that each of the anode layers may comprise a ratio of electrochemically active substance to electrolyte substance, with such ratios being higher for layers that are layered further from a surface of the anode that contacts a fuel gas than for layers that are layered closer to the fuel gas (P. 0012). The support layer may comprise a higher ratio of YSZ to nickel, and the active layer may comprise a lower ratio (P. 0017, 0059-0060/ FIGURE 4)

As to claim 10:

Sammes et al specifically disclose that the layer may comprise from 0-50 % volume of nickel (P. 0017). **FIGURE 4** shows with sufficient specificity Ni volume percents ranging from

much greater than 0 % vol to much less than 100 % vol, and specifically, from 10-30 % vol (See FIGURE 4). *Thus, Figure 4 provides specific guidance as to the amount of Ni.*

In view of the above, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the specific amount of the nickel-based material of Sammes et al in the porous metallic base body of Shibata et al as Sammes et al disclose that the specific amount of Ni is necessary to maintain a satisfactory degree of electrochemical activity. That is, to obtain a solid oxide fuel cell with a higher electrochemical activity.

As to the specific gradient of Ni concentration, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ the specific gradient of Ni concentration of Sammes et al in the porous metallic base body of Shibata et al as Sammes et al teach that such Ni concentration gradient is effective to produce high electrochemical activity while matching the thermal characteristics of the electrolyte layer. Thus, such Ni concentration gradient provides a compositional balance from one layer to another so as to prevent the nickel layer from splitting away from the electrolyte layer upon heating while also maintaining suitable electrochemical activity through the layers.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro
Primary Examiner
Art Unit 1745